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Rail-Road News.

Southern Railways.

The Savannah Republican sums up the great lines of Southern Railways now in progress as follows:

1. The Eastern Tennessee and Virginia Railroad, extending from Knoxville to the State line of Virginia, a distance of 139 miles. Most of this road is under contract. This is the connecting link between the Virginia and Tennessee and Georgia roads, and cannot be brought into profitable use until the latter are completed.

2 The Memphis and Charleston Railroad. It commences at Memphis, and runs by La Grange, in Tennessee, Jacinto, in Mississippi, Decatur, Tuscombia, and Huntsville, in Alabama, and strikes the Nashville and Chattanooga road at Crow Creek, making an entire length of line of two hundred and eighty one and a half miles.

3. The Nashville and Mississippi Railroad, extending from Nashville to the Mississippi river, at or near the dividing line between Tennessee and Kentucky, a distance of about 150 miles. We learn from good authority the construction of this road will be commenced as soon as a reasonable charter can be obtained. This is the last link to carry the road from Charleston and Savannah to the centre of the great Mississippi Valley, and is the natural prolongation of the Nashville and Chattanooga Railroad to that river, and will, doubtless receive efficient aid from the latter company.

4. The object of this road is to connect the East Tennessee and Georgia Railroad with the Nashville and Chattanooga and the Georgia roads, by a line of about thirty miles. A company has been organized for the construction of this road, and there can be no doubt of its speedy construction.

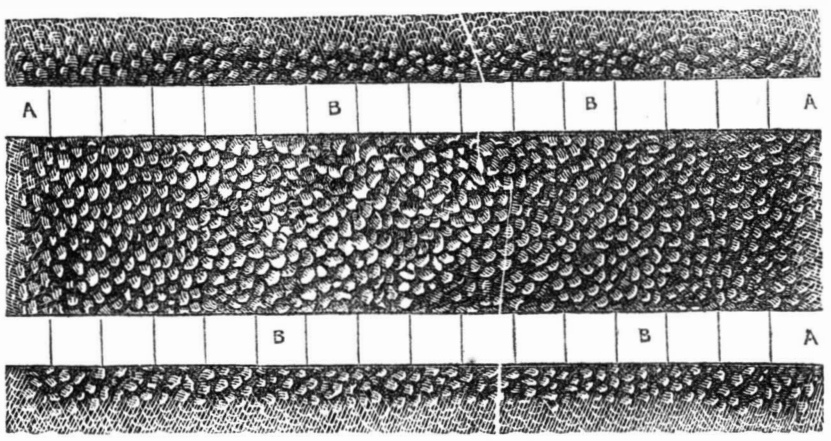
5. The Winchester and Huntsville Railroad. We understand that a large portion of the stock necessary to build this road has been subscribed, and there is every probability of its construction at no very remote period. It will constitute an important link between Nashville and Chattanooga and the Memphis and Charleston Railroad. Its length will be about 60 miles.

Ascending Heavy Grades.

On the Baltimore and Ohio Railroad, where there is a steep grade of 116 feet per mile, a locomotive, built by Ross Winans, has drawn up five passenger cars with a speed of 1 mile in four minutes, and then drew 117 tons up the same grade at the rate of 1 mile in eight minutes—she averaged 17½ miles per hour, with a pressure of 110 pounds of steam. The track was not sanded, and there was no slipping of the wheels.

The broad-guage speed has been equalled on a narrow-guage line—the South-Eastern—an engine built by Crampton, in England, having taken a train of carriages at the rate of seventy five miles an hour!

BLACK'S CAST-IRON TUBULAR TRACKWAY.---Fig. 1.

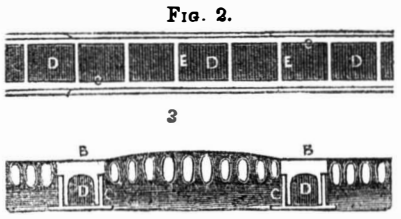


The accompanying engravings represent a new track-way for such a street as Broadway, esigned by Mr. W. A. Black, of Philadelphia.

Figure 1 is a plan of one track. Figure 2 is a plan of track with covers removed. Figure 3 is a transverse section.

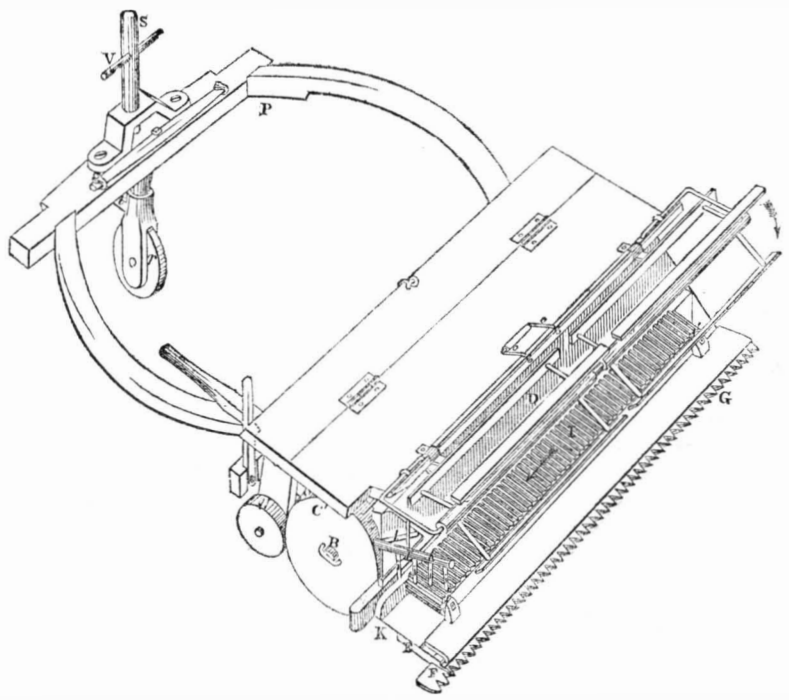
A A are cast iron tubes or boxes made in sections; B B are the covers. These can be removed at pleasure from their seats, D D, figure 2. The covers, B, project from the side of the tube, C, in order to lift them with a crowbar or other instrument. The covers are

FIG. 2.



kept firm in their places by the cross-pieces, E, figure 2. The plan view, figure 1, and the cross section, figure 3, show a paved mid way for the horses feet. It is graded and built of cobble or other such suitable stones. These boxes might not only be used for a good track-way, but as tubes or conveyors of water. The covers may be perforated without much detracting from their strength, as they can be cast very strong, and all the surface water can be drained away very rapidly, so as to have a dry surface nearly all the time. These hollow tracks can be built of any width which would be considered most suitable. The advantages claimed by Mr. Black, are these: cheapness of construction, durability, the ease with which it can be repaired without blocking up the street, and besides old iron can always be sold at a certain price. There are no fears of horses falling, and they will be able to draw with ten times the ease they now do on common pavements. This road is well worthy of attention; it is exceedingly simple, and has no little merit to recommend it.

START'S GRAIN REAPER.



The accompanying engraving is a perspective view of a Grain Reaper, invented by Mr. Wm. H. Start, of Smyrna, Kent Co., Delaware, for which a patent was granted on the 24th of last June (1851). A A is a strong frame; it rests upon the axle, B, of the running wheels, C. The wheels are fixed to the axletree by a catch on each, inserted in a notch on the axle, near the end of each hub. When the machine is drawn backwards, these catches have no effect on the notches, and both wheels turn independent of the axle. The front rail of the frame projects in front of the axle, to allow the cut grain to fall between the cutting apparatus and a fence, D, in front of the running wheels. The cutting apparatus consists of two members, the lower one, F, being stationary, and secured to the bar, E, while the upper one, G, is made to move to and fro over the roller. Each of these members consists of a toothed blade, which, as the machine advances into the standing grain, cuts it between the teeth. The motion of the cutting blade is given by a crank, with which it is connected by a rod. The crank is secured to a shaft at the front; the said shaft extends back and has a bevel pinion on its back end, gearing into a bevel wheel (not seen) on a short shaft parallel with the axis. This short shaft gears by bevel gearing with the axle, B; as the axle revolves, the crank is made to revolve also, and give the cutters a reciprocating motion. I is an endless apron behind the cutters, the cut grain falls on this apron, which is made to revolve by a belt that passes over a pulley on its shaft, and a corresponding one on the crank shaft spoken of. By the motion thus imparted to it, the upper part of the apron is forced to move in the direction of the arrow, by which means the cut grain is conveyed to the side, K, of the machine, and is heaped against a gate. The latter consists of a series of teeth, *i i*, secured to a head, *k*; this gate is secured to a piece fastened to the front bar of the shafts, P, and to the end of the fence, D. In the end of the axle outside the wheel there are one or two pins, which, as the axle revolves, strike the hind end of the gate handle. This makes the bunches of cut grain drop to the side clear of the machinery. In order to lay the cut grain evenly upon the endless apron, and to facilitate the action of the cutter, a reel revolves above the cutting apparatus. This reel can be raised or lowered to suit the kind of grain to be cut. The machine is advanced forward by a team behind, hitched to the whiffletree within the shafts, P. The parallel whiffletree bar behind has a vertical standard, S, having a wheel, *r*, on its lower part; it has a steering tiller, *t*, (seen partly below) by means of which the wheel is turned to change the direction of the machine. The upper part of the standard, S, has a cross bar, V, on it, by means of which, when the driver sits on the back bar, he can guide the wheel, *r*, as required. By hitching the team within the frame, the horses are enabled to walk more freely, while the machine is moving in a curve. When harnessed to a tongue which projects behind, their free movements are greatly impeded. The wheels are made high so as to give a decided advantage for ease; the grain is discharged in bunches, so that they can be bound with facility. Grass can be left in winrows by raising the gate.

More information about this machine may be obtained by letter addressed to the patentee.

A Marvellous Remedy for Burns.

Let the patient dip the part which is burnt into common washing fluid, letting it remain therein ten or fifteen minutes; if the burn is on any other part of the body than the feet or hands, the fluid may be applied with a piece of cloth rolled together with a string tied around it—dip one end into the fluid and apply freely on the burnt part. As there are washing fluids in market that are too weak, it may be well to add two ounces of pulverized pearlash to one pint of fluid. The great advantage of this remedy is, it relieves the pain instantaneously, and prevents the formation of blisters. In burns by which the skin is taken off, so that there is an open wound, the above remedy has not been tried. In such a case caution should be observed. I have used it several times in the course of two years.

Lynn, 1851. L. V.

[We believe that all the washing fluids are composed of caustic lye, and nothing else: this lye is made of dissolved pot or pearlash, or soda, and lime water. We do not like the receipt at all, and would be very loth to use it. It is given upon the authority of a known correspondent, but it would be much the better if some olive oil added to it, by which it would be made into a good salve.

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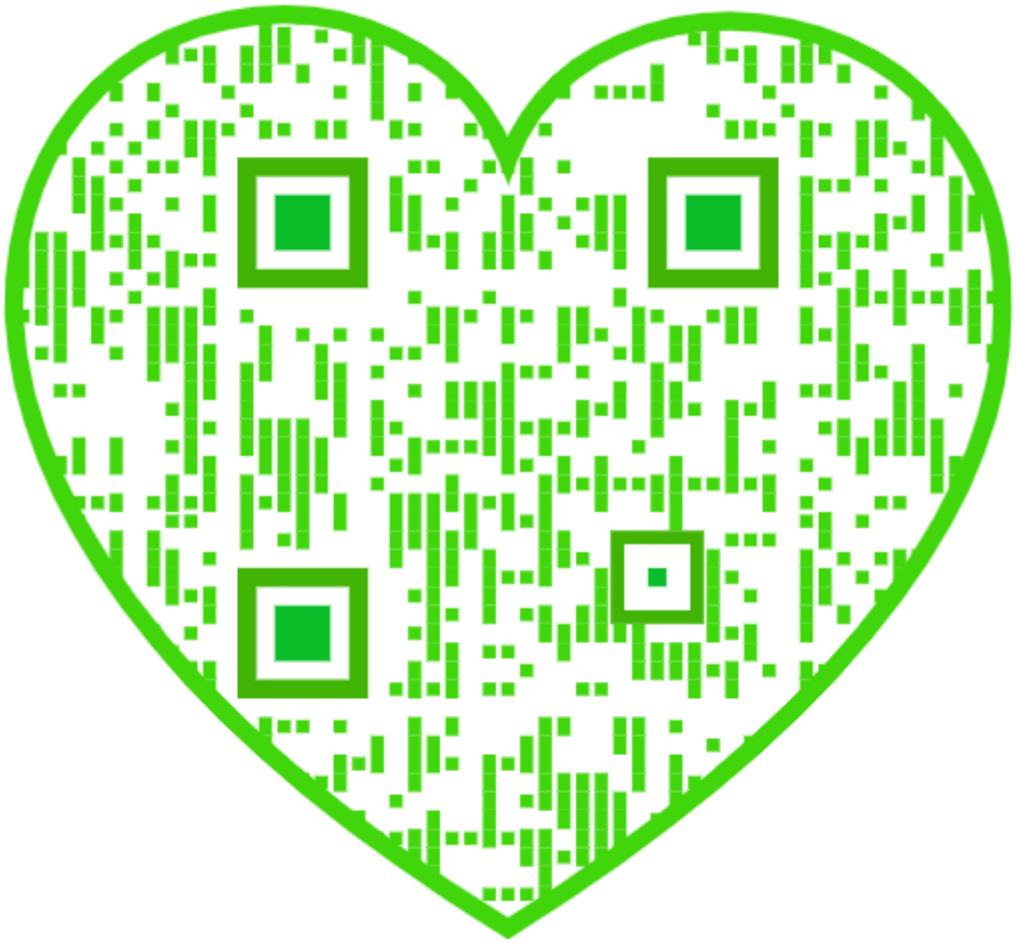

Miscellaneous.

Special Correspondence of the Scientific American
London, Aug. 5, 1851.

A Fiery Ordeal.---Improvement in Calico Printing.--Distinction Between Plants and Animals.

In my last I promised to send some further accounts of the proceedings of the Association of Science, which met at Ipswich, as mentioned by me previously.

You have heard of Mons. Boutigny, the French Fire Handler, well, he was at the meeting, and was pledged to thrust his hands into a pot of melted iron, to be prepared for this purpose at the foundry of Messrs. Ransome & May. Accordingly, at a few minutes before seven o'clock a large party assembled at the reception-room, and proceeded with the French Philosopher to the place of fiery ordeal. A pot of glowing metal red-hot from the furnace, being placed before M. Boutigny, that gentleman, having damped his hand with a little water, plunged it with impunity into the mass. The sensation, he assured the spectators, was one of cold rather than heat, and he gave the following *rationale* of the phenomenon :—The moisture of the skin became converted, by heat into that peculiar condition termed spheroidal vapor, which being a bad conductor of heat, effectually prevented the skin from being burned.

Wonders will never cease ; what will science do next.

At a meeting of the Section on Chemistry, Dr. Lyon Playfair read a communication from a Mr. Mercer, "on a new method of contracting the Fibres of Calico, and of obtaining on the Calico thus prepared Colors of much Brilliancy," which seems to effect an improvement of no little value to the manufacturer. Mr Mercer, who commenced his experiments in 1844, has ascertained that a cold solution of caustic soda—simple a thing as it is—has a peculiar effect on cotton fibre, causing it to contract and remain so, permanently, after the soda has been washed out. Caustic soda, as Dr. Playfair observed, has long been used in the process for bleaching cottons; but this power of altering the structure of the fibre, he says only belongs to the cold solution. The degree of condensation is equal to from one-fifth to one-third of the total volume of cotton employed.

The practical applications of the discovery may be inferred. The first obvious one would be that of converting coarser into finer fabrics which is effected by taking a coarser fabric an steeping it in the proper solution of caustic soda, in which the contraction of fibre imparts to it a fineness of appearance not before possessed. Dr. Playfair exhibited to the section specimens, brought from the industrial exhibition, and said the improvement is so great that, "if the finest calico made in England, known as 180 picks to the web, was thus acted upon, it immediately appeared as fine as 260 picks." Dr. P. also exhibited stockings of open weaving condensed in this manner into greater fineness.

Another application would be the improvement of colors, to which the condensation imparts depth and brilliancy.

"The effect of this alteration of texture was strikingly shown by colors. The pink cotton velvet had its tint depened to an intense degree by the condensation process. Printed calico, especially with colors hitherto applied with little satisfaction, as lilac, had strength and brilliancy; besides thus producing fabrics cheaply finer than can possibly be woven by hand. The effect was shown of patterns being formed by portions of a surface being protected by gum from condensation. Thus patterns of apparently fine work can easily be produced. It was stated that the fabrics by this process have much strength given them—for a string of calico one-half condensed by caustic soda will break by 20 oz., while the unacted-upon string broke with 13 ounces.

Mr. Mercer's paper was deemed of sufficient importance to be made the subject of a discussion between such men as Faraday, Dumas, and others; and it is proposed that microscopic examinations should be made for the purpose of ascertaining the mode and nature of the change effected in cotton fibre by this new process, which, as the report declares, "bids fair to exercise an immediate and extensive alteration in the patterns and produce of cotton fabrics."

Professor Owen delivered a discourse on the distinction between plants and animals, and their changes of form. There was a much larger attendance than on the occasion of the first general meeting.

Professor Owen commenced his discourse by observing that though it might appear to most persons to be easy to distinguish a plant from an animal, yet naturalists had always experienced considerable difficulty in drawing the distinctive line. The definitions given by Linnæus were, that minerals grow, that vegetables grow and live, and that animals grow, live, move and feel ; but these definitions have since been found to be incorrect, because there are several moving plants, such as the sensitive plant, and young sea weeds; and there are animals, as the barnacles, molusca and zoophytes, which are fixed. Another mark of distinction which had been attempted was the possession of a stomach, but this was little more satisfactory than the former, for in many animals the sign of a stomach could scarcely be discerned, whilst most plants possess organs closely analogous to those of the stomach. General chemical distinctions had been attempted. For example, most animals exhale carbonic acid gas, while plants exhale oxygen; and carbonic acid gas, though fatal to animals, is the nutriment of plants; but even those distinctions have been recently ascertained to be not universal, for a genus of zoophite has been discovered that exhales pure oxygen ; and mushrooms and algæ have long been known to exhale carbonic acid gas. The chemical constitution of plants has also failed to establish a distinction, for though nitrogen is not a usual ingredient in vegetable substances, the chemical elements of plants and animals in the lower orders closely assimilated. No distinctive feature between plants and animals having been established by the botanist, the anatomist, the zoologist, or the chemist, recourse must be had to the physiologist. A correct distinction could not, indeed, be founded on any one of the elements he had indicated, and to arrive at an unquestionable line of separation from the animal kingdom, it would be requisite to call in aid a combination of those distinctive marks, and thus to build up a wall of separation. With respect to minerals, indeed the difficulty was not so great, though he was not disposed to agree with Linnæus in the opinion that the increase of animal substances by the aggregation of matter externally could be correctly denominated growth. Professor Owen then proceeded to point out the changes that animals undergo from the embryo state to their arrival at their full development; and he dwelt particularly on those that are metamorphosed in their progress to a perfect state. All animals are originally composed of a simple cell or sphere, and it is by continual addition and change they become what they subsequently appear. Among the remarkable changes that occur in the larger animals after birth, he instanced the lion and the red deer: the former being born spotted like a leopard, and the latter also spotted like the fallow-deer. The metamorphoses of the tadpole to a frog were specially dwelt upon, and the changes of their internal organs, so as to adapt them after living in water to breathe on land, were pointed out. The colioptera, or beetle tribe of insects, were next noticed, and their changes from a grub to a chrysalis, and to a perfect beetle. It is in their larvæ or grub state, that they do most good or injury, in consequence of the large amount of food they devour. The food they then live upon is the coarsest part of plants, whilst the perfect insect feeds only on the most elaborate juices of vegetables. The cockroaches and aphides, though classed by entomologists among those insects which are not metamorphosed, do, in fact, undergo changes in the egg. The aphis possesses the remarkable property of reproduction; if placed in favorable circumstances, the young insects budding out of it, and afterwards becoming living insects; and M. Bonnet the French naturalist, had ascertained that the same insect will thus bud and reproduce, in some instances, eleven times. To this mode of reproduction Professor Owen applied the term "Metagenesis." The formation of the medusa by the aggregation of a great number of cells, and the development of their organs by elongation, were next pointed out. In remarking on the individual peculiarities of animals, Professor Owen observed that every genus of animals has internal parasites peculiar to itself, and that in some there are several distinct species of internal parasites. Recent researches of entomologists have, however, tended to limit the number of the species of insects, for it has been found that many which were supposed to be distinct, are only the young of other insects, and Professor Owen expressed an opinion, that on further investigation, many others that are now considered distinct would be found to be only young insects undeveloped. The origin of plants was stated to be similar to that of animals. Their normal condition is likewise that of a single cell, which by aggregation and change becomes the perfect plant. In considering the limitation of development, Professor Owen said that the higher the order of animals and plants, the less was their power of reproduction, for their energies might be considered as being directed to the perfecting of their individual organization, instead of being expended in the multiplication of the species. Professor Owen's lecture, which was illustrated by a great variety of diagrams, was received with enthusiastic applause. Excelsior.

[We have no doubt but the above will be exceedingly interesting to every one of our subscribers. It is one of the finest descriptions of the difference between plants and animals that we ever read —[Ed.

Dental Operation on an Elephant.

A short time since the elephant at the Boulevard of the Temple in Paris, named Aly Scha gave signs of madness during a performance. The superintendant, M. Hugier, at once stopped the performance and proceeded to consult with competent individuals upon the subject. In consequence he called M. Chapart from his Zoological Museum, veterinary surgeon in chief to the School at Alfort and to the Guard Municipale. After having felt the pulse of this colossus, the consulting surgeons declared that the animal was attacked by hypochondri in consequence of caries at the root of his tusks, and advised the removal of them, which were a yard and a half each in length. To aid in this attempt, M. Hugier endeavored to put the animal to sleep by means of opium and chloroform, but though administered in immense quantity, they had no apparent effect, and they were compelled to employ a windlass to hold him down.

The operation took place July 7th, before thirty of the pupils of the veterinary school, and a crowd of veterinary surgeons. The animal was alternately placed on each side for the different teeth, and with the aid of a saw and forceps, and cord attached the teeth were cut off and the roots extracted, which alone weighed eighteen pounds. His teeth will not be replaced. As for Aly Scha, he is a little ill after this severe operation, but it is confidently expected that he will have no returns of madness, and that he soon will be able to resume his exercises which the public find so amusing.

Vegetable Wonders.

At our office in the California Exchange may be seen some of the most luxuriant, enormous specimens of the productious of Santa Clara Valley, which have ever been exhibited. They consist of barley, clover, grasses, wild oats, apples, pears, figs, sweet clover, &c One cluster of clover, from a single root, weighed some five or six pounds, some of the stalks being over ten feet in height. The barley weighed over an ounce, each head. The specimens were gathered and are exhibited by Mr. C. A. Shelton, who has done much towards directing public attention to the agricultural and floral resources and wealth of California. —[Alta California.

The Works of the Cæsars and the Stephensons.

During the recent sittings of the Institution of British Artists, the Rev. R Burgess read a valuable paper on "Ancient Roman Roads and Modern British Railways." Adverting historicaly to the successive labors of the Roman Emperors in the formation and repair of roads in Rome and its provinces, the lecturer showed that a continuous roadway existed from the wall of Antoninus, in North Britain, to Rome, and thence to Jerusalem, a distance of 3,655 miles exclusive of a sea passage of 85 miles; and in illustration of the character of Roman roads, he selected for description the Via Appia, one of the twenty-nine roads which diverged from the Imperial City, quoting particularly the description of it by Procopius, and referring generally to the account given by Vitruvius of the various kinds of roads and their respective formation. Comparing the modern British Railways with these ancient ways, he dwelt on their general similarity in directness of their level surface, and the severance of natural obstacles in order to attain those objects. He minutely compared the great Masonic works on the Via Appia with the High-level-bridge at Newcastle, the Tweed Viaduct at Berwick, and the Britannia and Conway Bridges; arriving at the conclusion that one hundred such works as the great substructure of the Appian way at Arici would hardly equal in cubic contents and probable cost the four great works in question. He adverted to the enormous cost of these modern structures, observing that the charges for land, law, and Parliamentary expenses, were unknown to the Romans; and expressed, in conclusion, the assurance that our own superiority consisted more in the mental power and scientific knowledge than in the mere application of unskillful labor. In the discussion which ensued, the general importance of improved communication, as evinced in the present Congress of all Nations, was especially referred to; and, among matters of detail, the various systems of paving recently adopted in the metropolis were discussed. The Chairman proposed a vote of thanks to Mr. Burgess, and adjourned the meeting till November.

Extraordinary Gardening.

A letter from Paris, in the Boston Atlas, says :—"A gardener near the Jardin des Plantes, has the good fortune to collect the aristocracy in his great green-house, this week —you see the gardeners are in full tide to fortune now—for he appears to possess one of Moses's gifts. In the middle of one of the borders of his garden are several dahlia stalks and rose-bushes, covered with leaves, but without a single blossom, or even buds, after you have closely examined these plants, the gardener takes a watering-pot filled with liquid composition, waters the plants, and then covers them with a glass, and asks you to look at them. In a minute you see the plant in travail, a bud is formed, it expands, it becomes a flower—all in ten minutes. Cut the flower, and it appears as perfect as if it had been nurtured by the sun. Nor is this all, in an adjoining bed he has cherry trees covered with leaves; he performs the same operation I have just recounted, and in eight minutes you have a plateful of ripe cherries."

[We apprehend the above is too good news to be true. A few years ago, quite an excitement was raised about the application of the galvanic current to produce the rapid development of plants, and it was confidently asserted that melons, &c., could be brought to maturity in a few days. Some very successful experiments were made, but the subject has become obsolete.

Daniel Kirkwood.

Mr. Daniel Kirkwood, A. M , of Pottsville, the well-known discoverer of the great law of planetary relations known as "Kirkwood's Law," has been tendered and has accepted the Professorship of Mathematics and Astronomy in Delaware College The high reputation Mr. Kirkwood has acquired in these departments of science, both in this country and Europe, furnishes a sufficient guarantee of talents and abilities which are of no common order.

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[Correspondence of the Scientific American.]

American Association for the Advancement of Science.

ALBANY, N. Y., Aug. 20, 1851.

This respectable association met yesterday and organized, Professor Louis Aggasiz in the chair. The chairman is a foreigner and is the pupil of the celebrated Cuvier. He is allowed to be the first zoologist in the world, and is the author of the Glazial Theory in Geology. He is a splendid looking man, and speaks with a slighl y foreign accent. The business transacted the first day was of little newspaper interest, I will therefore not present an account of the papers presented in regular order, nor speak of some at all, because of so little importance to the readers of the Scientific American.

SOLAR ECLIPSE OF 1851.—Lieut. Davis presented a very able paper, chiefly relating to the discovery of Mr. Longstreth as published in the American Nautical Almanack relating to the longitudes, and whereby his production in reference to the exact period of the eclipse surpassed in correctness, that of all the European astronomers. In reference to longitude, astronomy, although set down to be the most correct of all sciences, has been nothing heretofore but a shifting sandbar Mr. Longstreth's discovery will rectify many errors. Prof. Pierce, of Harvard, and one of our most eminent philosophers connected with the observatories, congratulated America on the importance of this discovery. Within two years the discoveries of Americans in astronomy have elevated our country very highly in the eyes of the world.

EQUINOX STORMS.—Prof. Loomis, of New York University, read a very interesting paper on observations made during the month of September in reference to the quantity of rain which fell in London and New York; the whole evidence collected went to prove that no more rain fell during the equinox season than any other. He therefore set down the common accepted opinion "that more rain fell during that period than any other," as fabulous, and asserted that it should be classed among the old legends. This paper called forth a sharp discussion, a French gentleman said it might suit certain localities, but he knew that on the Mediterranean, in Europe, and in California, the equinoxes were rainy seasons. Dr. Redfield, of New York, and Dr. Hare, of Philadelphia, had some sharp shooting in reference to the equinoxial storms. Dr. Hare derides the theory of Redfield, which is so well known respecting whirling storms, and he made one remark which I never heard made before, viz, that our heavy winds during the fall could all be traced to the Gulf of Florida—the hot and cold currrents.

PERMEABILITY OF METALS TO MERCURY.—Prof. Horsford read a very interesting paper on this subject. By his experiments it was proven that a piece of lead made in the shape of a syphon with the short end dipped in a cup of mercury, acted as a syphon for the mercury flowed like a fluid,—gravity acted upon the mercury like water with the common siphon. Experiments in reference to the permeability of one metal to another had been made some years before by Prof. Joseph Henry, who made some remarks on the subject, one of which is worthy of note. He went to a silver plater in Philadelphia, and enquired about his method of plating, and found that when silver was put on copper, the copper put in the fire, and then dipped in sulphuric acid, that the silver was all burned off. He told the plater to scrape off the surface from which the silver had disappeared, when lo, the silver was found underneath, thus showing the permeability of copper to silver. Galvanic plating has done away with the old method entirely—the old way of silver plating is now obsolete.

TIDAL OBSERVARIONS.—Prof. Bache of the coast survey read a paper illustrated by diagrams, in reference to tidal observations made at Cat Island, Lousiana. This paper was a continuance of one read at the New Haven meeting last year. It was exceedingly interesting and displayed a great acquaintance with astronomy and mathematics, together with much patient labor—the grand secret of correctness—but it is impossible without figures to give an idea of the action of the new law discovered in reference to the tidal wave.

STORMS—STORMS.—Dr. Hare, of Philadelphia, read a paper containing strictures on the report of Prof Espy, on storms. Dr. Redfield replied, and it was storm after storm by Hare and Redfield. The subject was very interesting to them, and was made so to the audience. Prof. Hare looks like a shaggy bear when aroused, and is very sarcastic.

ATMOSPHERE OF VENUS.—Prof. Alexander of Princetown, read a paper on the atmosphere of Venus. It was to show that she had an atmosphere, and his observations were such that he saw spots in it like that seen in the sun's, and other times none were visible. Prof. Pierce said, 'if Venus has an atmosphere, it must be twice as hot as that of the earth, very irregular, and less dense.' He believed that the atmosphere of Jupiter and Saturn were very dense.

FREEZING OF VEGETABLES.—Professor Le Conte read a splendid paper on the *freezing of vegetables*. It elicited great attention and justly so. I thought this subject was pretty generally understood. The cause of some plants freezing more readily than others depends on the quantity of moisture in them, or the nature of the skin or bark. If the skin is thick and a good non-conductor, the less liable is the plant to freeze, and vice versa.

FLOWERS OF CALIFORNIA.—Dr. Le Conte, of New York, who I take to be a brother of the other gentleman, read a most interesting paper on the flowers of the golden land. It seems that California is one great flower garden above, as well as a great gold mine beneath. It is a land of beautiful flowers, the thorns I suppose are to be found in the human species only. The doctor was in California, and collected a thousand zoological specimens from that country.

A number of papers had no earthly interest, whatever, to me, and I presume would be of none to the readers of the Sci. Am. One thing struck me forcibly in reference to many of them, viz., the absence of anything relating to the practical arts—nothing on engineering—nothing about chemistry applied to the every day arts in fact, I believe our American Association is yet destitute of a class of members more practically useful than the great majority (not all) which they now have, I mean our engineers and mechanics, but because useful, such kind of members would no doubt be considered as detracting from *the dignity*—alas, not true dignity—of the association. There would then not be so much fuss made by the big folks with the association. I will also say here, that the Albanians have not shown the courtesy and good sense, which those who managed the business in Cincinnati did.

More subjects will be noticed next week.

CLOUD RINGS OF THE EARTH.—Lieutenant Maury read a paper on the equatorial cloud rings, he stated that sailors have opportunities of making observations on clouds, and the various phenomena accompanying them, which no other class enjoy. The mariner to the southern hemisphere enters the regions of the N. E. trade winds, and often finds the sky mottled with clouds, but clear. As he approaches the equator, his thermometer rises until he enters said region where he finds it murky, close, and oppressive; when he enters the S. E. trade winds, he is surprised to find—notwithstanding the oppressive weather—that his barometer and thermometer stand lower than in the clear weather out of which he came.

The cloud ring and the vaporous region he described with great minuteness, asserting that the rain came with the trade winds under the cloud ring. This ring is formed by the meeting of the N. E. and S. E. trade winds, these bring the vapors from the regions which they traverse. The reason why the thermometer is lower under the cloud ring than in the region on either side, is therefore obvious. If the clouds which overhang this belt were luminous, and could they be seen by an observer, from one of the planets, they would present an appearance not unlike the rays of Saturn. It also had an apparent movement contrary to that of the earth because it was relatively slower, it had therefore an apparent slow motion from east to west. It was therefore, somewhat unlike the ring of Saturn in that respect, also in its being rough and jaggard. Navigators were now learning to know when they were passed the cloud ring, by the thermometer. Lieut. Maury is one who is always seeking to apply his great learning to a useful purpose. I predict that to this country, in a few years more, the eyes of all the world will be turned for all true and reliable nautical imformation, and no man has done so much, I believe, for practical navigation in our country as he.

The rings of Saturn are puzzles to astronomers, one attributing them to this, another to that. Nichol supposes the ring to be composed of some exceedingly strong material—as tough as platinum, I believe, while another believes they are a number of rings, altogether, and these composed of no stronger material than some fluid. Doctors certainly do differ.

* *

Facts for the Curious---Female Beauty.

The ladies of Arabia stain their fingers and and toes red, their eye-brows black and their lips blue. In Persia, they paint a black streak around the eyes, and ornament their faces with various figures. The Japanese women gild their teeth, and those of the Indies paint them red. The pearl of the teeth must be dyed black to be beautiful in Guzurat. The Hottentot women paint the entire body in compartments of red and black. In Greenland the women color their faces with blue and yellow, and they frequently tattoo their bodies by saturating thread in soot, inserting them beneath the skin, and then drawing them through. Hindoo females, when they wish to appear particularly lovely, smear themselves with a mixture of saffron, tumeric and grease. In nearly all islands of the Pacific and Indian oceans, the women, as well as the men, tattoo a great variety of figures on the face, the lips, tongue, and the whole body. In New Holland, they cut themselves withshells, and keeping the woundsopen a long time form deep scars in the flesh, which they deem highly ornamental. And another singular addition is made to their beauty by taking off, in infancy, the little finger of the left hand, at the second joint. In ancient Persia, an aquiline nose was often thought worthy of the crown; but the Sumatran mother carefully flattenes the nose of her daughter. Among some of the savage tribes of Oregon, and also in Sumatra and Arracan, continual pressure is applied to the skull in order to flatten it, and thus give it a new beauty. The modern Persians have a strong aversion to red hair; the Turks, on the contrary, are warm admirers of it. In China small round eyes are liked; and the girls are continually plucking their eye brows, that they may be thin and long. But the great beauty of a Chinese lady is in her feet, which, in childhood, are so compressed by bandages as effectually to prevent any further increase in in size. The four smaller toes are turned under the foot, to the sole of which they firmly adhere; and the poor girl not only endures much pain, but becomes a cripple for life. Another mark of beauty consists in finger nails so long that casings of bamboo are necessary to preserve them from injury. An African beauty must have small eyes, thick lips, a large flat nose, and a skin beautifully black. In New Guinea, the nose is perforated and a large piece of wood or bone inserted. In the northwest coast of America, an incision more than two inches in length is made in the lower lip, and then filled with a wooden plug. In Guiana, the lips are pierced with thorns, the heads being inside the mouth, and the point resting on the chin. The Tunisian woman, of moderate pretensions to beauty, needs a slave under each arm, to support her when she walks, and a perfect belle carries flesh enough to load down a camel.

A Natural Bridge in Alabama.

Professor Tuomey, in his recent geographical exploration of this State, found a natural bridge in Walker county, about a mile from the main road, which rivals the celebrated one in Virginia. It spans about one-hundred and twenty feet, while its height is about seventy. It is formed of massive sandstone, and is very symetrical. The surrounding scenery is very grand, and lofty beech and hemlock trees growing on the bridge nearly shade it from the rays of the sun and add to the wild sublimity of the spot. A lengthy and scientific description of this bridge, and other scenes of mountainous grandeur in north Alabama, may be expected in Professor Tuomey's next report.—[Mobile Register.

Manufacture of Stoves in Albany.

The Albany Register publishes some statistics of the manufacture of stoves by two firms of that city.

"The engines used in each are of forty-five horse power. The three furnaces, which are used eleven months, in each, melt forty tons of iron per day. The average number of moulds on each floor is thirty five-hundred. The amount of iron used by each is three thousand tons per year, which, at $24 per ton, amounts to an expenditure of $72,000 in each for iron alone. Each part of the business is carried on in these establishments, from the melting of the iron to the finishing up of the stoves, and the average number of stoves manufactured by them amounts to fifty-five annually. The different number of pieces of castings will number one million five hundred thousand yearly. The number of men employed in both establishments is from four hundred and fifty to five hundred, and the wages in each establishment amounts to $90,000 annually. The average sales of each establishment amount from $250,000 to $300,000 annually. There are at the least calculation, fifteen thousand tons of iron used in the stove manufacture in that city, and the number manufactured reaches one hundred and fifty thousand annually. The aggregate sales amount to be over a million and a half of dollars. The number of hands employed is fourteen hundred."

Important to Whalemen.

We are indebted to the learned Lieut. Maury, for a copy of the new Whaling Chart. This chart divides the ocean into districts of 5° latitude by 5° longitude, perpendicularly through each of which districts are 12 columns, for the months in the year, and horizontally through each of which districts are three lines, one to show the number of days that have been spent in every district in each month, and the two others to show the number of days in which whales, sperm, or right have been seen. This chart is exceedingly useful to whalemen; by applying to G. Manning, of New York, or Dr. McKenzie, of New Bedford, whalemen will get all the requisite information. No man has done, or is doing so much to discover the mysteries of the Great Deep, and collect useful information for our mariners as Lieut. Maury. By the chart, we learn that between the Sandwich Islands and Japan, there is excellent fishing for the sperm whale. The right whale appears to be plenty around King George's Sound, in Australia. Around New Zealand appears to be good fishing ground, and from San Francisco west, versus east, the Pacific appears to be a favorite resort of the sperm.

Robert Fulton and Mr. Baine.

In Baine's "History of Liverpool," just published in England, the full credit is candidly given to Robert Fulton, as the successful inventor of steam navigation. He says:—"The first laurel in connection with steam navigation certainly belongs to Robert Fulton, who formed the most useful and beautiful art of steam navigation, partly on his own discoveries, partly on the abortive and unprofitable experiments of others. He commenced his experiments in steam navigation as early ly as 1793 but laid them aside for objects less worthy of his attention until 1803."

To Prevent the Explosion of Boilers.

A correspondent of the Cincinnati Daily Times, proposes that a wire gauze diaphram be placed in every boiler to separate the water from the steam. He asserts that it will act like the wire gauge of Davy's safety lamp, and prevent explosions.

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New Inventions.

Improvement in Oscillating Steam Engines.

Messrs. James Wylie & Ephraim Morris, of this city (New York), have taken measures to secure a most valuable and unique improvement in the reversing action of the simple and one direction oscillating engine. This oscillating engine itself is the most simple that we have ever seen; the steam and exhaust box is stationary, and there is no valve rod nor slide whatever; the engine exhausts and takes in its steam through two ports on the top of the cylinder at the centre, but there are three openings in the box for the steam and exhaust. For stationary engines, which did not require to be reversed, the old plan of allowing it to move in one direction was quite sufficient, but for large and movable engines, such as locomotives and steamboats, the reverse motion is a positive requirement. The plan invented to do this is exceedingly simple—by a peculiar arrangement of the exhaust and steam openings in the chest, a simple hollow slide valve is made to shut off the steam, let it on, and also change the steam into the exhaust port, and vice versa. This same covered slide can be made to cut off by various devices, but the simple method of reversing the passages, is a most excellent improvement. It is, we believe, the best oscillating engine ever invented.

New Locomotive Shoe.

James Mulholland, Esq., master machinist of the Reading Railroad, has invented what he calls a "Mountain Shoe," designed to moderate the speed of cars in descending a heavy grade, when the rails are slippery from rain or other cause. In a late trial of the shoe, it brought, down a grade of 300 feet to the mile, 50 coal carts, at an average speed of 5 miles per hour. The efficacy of the shoe consists simply in its form—being provided with an additional curve from the one in which the wheel rests, and this being formed at an angle, which gives the most powerful resistance to the downward pressure. They are also instantly removed from the wheels by a backward motion of the train, the fore wheels of the car acting upon a curve in front of the shoe, removes them from the rail to the side of the track.

Important Improvement in Setting Teeth.

At the recent annual meeting of the American Society of Dental Surgeons, held in the city of Philadelphia, a new method of setting teeth was introduced by Dr. Allen, of Cincinnati, which consists in uniting small teeth firmly to each other and to the plate upon which they are set, by means of a fusible silicious cement, which is flowed in between and around the base of the artificial teeth upon the plate, in such a manner as to form a most perfect artificial gum. This cement is harder and stronger than the teeth, and cannot be acted upon by saliva or acids. The advantages of this method over the usual mode are, great strength, cleanliness, facility, and a much more natural and life-like appearance of the teeth and gums.

We examined several specimens of teeth set upon this plan, shown us by Dr. Allen, and the appearance is decidedly beautiful, and resembles the natural gum as nearly as it is possible for art to do. The teeth are firmly held in place by the cement and cannot be removed with forceps without breaking away a portion of it. The cement itself is nearly, if not quite, as hard as porcelain teeth.

Improvement in Kilns.

Mr. Wm. Silver, Jr., of Bennington, Vt., has taken measures to secure a patent for an improvement in kilns, which he has recently made. He carries the draft upward from the furnace through an upright flue standing in the centre of the kiln, and extending nearly to the top, and then downwards through the body of the kiln and through openings in its floor, to a series of circular flues arranged below the floor, and communicating with the chimney; the effect produced thereby being that of a more perfect consumption of the smoke and the generation of a greater amount of applied heat from the same quantity of fuel.

Tartar on the Teeth.

M. La Baume, says the Medical Times, ascertained that vinegar and a brush will in a few days remove the tartar; thus obviating the necessity for filing or scraping them, which so often injures the enamel. He recommends the use of powdered charcoal and tincture of rhatalfy afterwards, which effectually, in his opinion, prevents its formation.

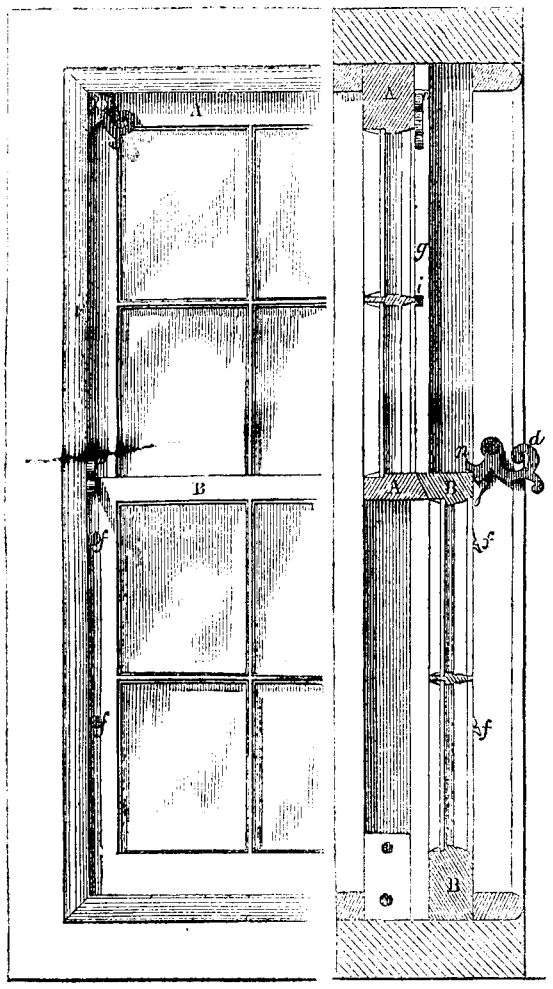
Improvement in Building Carriages.

E. Haskell & Co., carriage manufacturers of this city have recently constructed several vehicles with Everett's patent coupling, and have also adapted it to one or two old ones. This plan of coupling has hitherto been a desideratum and the great wonder now is, after the experiment has been successfully tested and the advantages realized, that the discovery was not made long ago. This improvement admits the use of large fore wheels with all the advantages derived from them in saving friction and surmounting obstacles with facility, and at the same time obviating or entirely removing the disadvantages which have attended their employment. With this improvement a carriage can be turned in as short a space as those that have small wheels which run under the body.—[Philadelphia Ledger.

[We are glad to see this improvement spreading out. This invention is illustrated on page 284, present volume.

PATENT SASH CATCH.

Figure 1. Figure 2.



The accompanying engraving represents an improvement in Catches for window sashes, for which a patent was granted on the first of last month (July, 1851), to the inventor, Mr. Washburn Race, of Seneca Falls, N. Y. The nature of this invention consists in constructing and arranging the catches which hold up the upper sash of a window in such a manner that they can be operated to release the upper sash and allow it to open, or to secure it in any desired position, either open or closed, by means of the lower sash, without applying the hands to the upper sash or its catches. The accompanying engraving embraces two figures: figure 1 is an elevation of a window, with both sashes closed, as seen from the inner side; figure 2 is a vertical section of the same. A is the upper, and B the lower sash; the latter is fitted with a catch, *d*, of any approved construction. The upper sash is fitted with two catches, *e e*, the shorter arms of which are borne against the centre slats, *g*, of the window frame, by the weight of their longer arms, and engage in suitable notches, *i i*. The longer arms of these catches depend below their pivots, and their position with respect to the lower sash of the window, is such that when the said sash is pushed upwards, its top bar will strike the longer arms of the catches of the upper sash, raising them and disengaging their shorter arms from their notches in the centre slats. If the lower sash is then slowly let down, the upper sash [being released by the withdrawal of its catches from their respective notches] will descend with it. If the descent of the upper sash is to be stopped, the lower sash is moved suddenly downwards, by which means its top bar is drawn away from the longer arms of the upper sash catches, which, being no longer supported, will descend by their own gravity and force their respective shorter arms into the next succeeding notches of the centre slats, thus stopping the further descent of the upper sash. When the upper sash is to be raised, the lower one is pushed upwards; in its upward movement its top bar strikes the upper sash catches and detaches them from the notches; if the lower sash be now moved further, it will carry the upper sash with it to its uppermost position. The lower sash is then moved suddenly downwards, by which means, as before stated, the upper sash catches are allowed to engage with their respective notches in the centre slats, thus securing the sash in its uppermost position. It will thus be perceived, how that by operating the lower sash, which is within easy reach, the upper sash is readily opened and closed without the operators having recourse to a chair to reach the upper catches. The employment of two catches prevents the upper sash from sagging. *f f* are stops for the hook, *n*, of the lower catch, *d*, to retain it in the designated positions. The claim is "for the arrangement of the catches and window sashes for the purpose described.

More information may be obtained of the patentee by letter addressed to him.

Mr. Race is a veteran inventor, and his improvements are all of the useful class. The firm of Washburn Race & Co., of Seneca Falls, have been very prosperous as stove manufacturers,—Mr. Race being the inventor of the "Self regulating Stove." The village of Seneca Falls is a thriving place—we know it well, and know also that its prosperity can be traced to the skill of its mechanics, and the genius of such men as Mr. Race.

New Economy in Steam.

Patents have been taken out in nearly all the large States of Europe for a discovery which, if it realizes only one-fourth of what the inventor promises, will cause a total revolution in the application of steam power. The patentee, who is an American engineer of great celebrity, professes to have perfected an engine by which the steam, instead of passing off in a half consumed state, deposits its caloric and recovers new power, thus effecting an economy of 90 per cent. The idea on which the invention is founded, appears to have been borrowed from the respirator worn over the mouth by consumptive persons, and in which the caloric of the breath, instead of being lost in the atmosphere, is arrested by metallic meshes and warms the cold air taken into the lungs. The experiments already made by the inventor have it is said, proved sufficiently satisfactory to induce him to construct an engine of one hundred horse-power, which will shortly be in operation.—[Galligniani.

[The above is strange—very. We presume the engineer must be one of those fellows who know how to astonish the Parisians.

Improvement in the Jacquard.

Mr. Joseph Reynolds, of Providence, R. I., has taken measures to secure a patent—1st. For operating on the knot cords of the jacquard, to cause them to open the sheds of the warps in all directions simultaneously, one part of the shed being raised during the time the other part is being depressed, so that each part requires to be opened only half way to make an open shed. 2nd. For controlling the opening of the shed, so that it shall always open to the same width at the place where the shuttle passes through, with the threads at the same inclination. 3rd. For hanging the vibrating levers which operate the trap boards upon their shafts, so as to open and close the shed more slowly when it is nearly wide open, and quicker when it commences opening and when about closing, thereby to gain more time for the filling, owing to the longer time it is wide or nearly wide open.

The Snail Telegraph Again.

The Paris papers, by the latest arrivals, were descanting with a mixture of nonsense and sense, not uncommon to some of them, such as the *Presse*, about the "Snail Telegraph." Here is a description of this Telegraph:—"In a sort of barn are two structures of wood placed on open stands. In the front of each was a large wooden wheel moving on its centre. This wheel, about two yards in diameter, presented the most singular appearance; 300 or 400 snails were kept immovable by means of a sort of paste in a reservoir in zinc; the open part of the shells was toward the spectator, and some of them protruded their heads. On the wheels were lines of metal, on one of which were the snails, and on the other letters of the alphabet. The reservoirs of zinc in which the snails were placed were lined with cloth and copper, like the voltaic pile, and all the reservoirs were connected by conducting wires which were collected on the axis of the wheel. One apparatus was to serve to send a dispatch, the other to receive it—such as from Paris to London. In turning the wheel the letter required was brought to an opening, and designated by a needle. Each time that Paris sent up a letter to the opening, and designated it by the needle, M. Benoist, in the structure called London, wrote it with a pencil on paper, after having discovered it on his own wheel, by, as he said, moving a snail in its reservoir on the letters, which snail made a movement on passing by the letter indicated."

This is one of those h——g inventions got up to deceive some ignorant but rich speculating *honest* gentleman: it has been visited by Emille de Girardin Victor Hugo, and other public notables, but ignorant of science. It is some electro magnetic deception. There is more than one such invention, though not of a like nature, before our own people at the present moment.

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Scientific American

NEW YORK, AUGUST 30, 1851.

Steamboat and Railroad.

The choice between steamboat and railroad travelling, in respect to comfort, requires no second consideration, and admits of no argument to decide in favor of the former. On board of the steamboat, all is clear, cool, and quiet, and if pleasure and not profit in the relation of time was alone weighed in the balance, no person would be found travelling on the iron rail. Yet there is no good reason why this should be so, at least in so large a measure. The great evils of our railway system, as it relates to the comfort of the passengers, may be set down to belong to two things, these are the bad ventilation of the cars, and the use of wood fuel for the locomotive. If our railway tracks are dry, the clothes of the passengers are covered with so much dust that all have, at the end of the journey, the appearance of a disbanded set of plaster grinders. If by good fortune a shower has laid the dust on the track, no one need plume himself on the safety of his broad cloth or throw disrespect on his spectacles. The engine starts and the screen of the spark arrester (there is not a good one in existence) acting the part of a sieve, scatters fire and smoke broad-cast on all behind. Like the plauge of locusts, they enter the windows, the ears, the eyes, the nose—in short, we have never known a single person, who ever travelled one hundred miles on any of our railroads, without suffering from a severe headache. The passenger cars are comfortable so far as finish and decorations are concerned, and were they well ventilated, the sparks, smoke, and dust kept out, the railroad, in all cases, owing to the greater speed of travel, would certainly be the first choice of the great majority. We do not understand why coal or coke is not used instead of wood. Is it owing to the expense, or the impossibility of our engineers not knowing how to use the same? The former it may be, but surely not the latter.

A few years ago, all the steamboats on the North River used wood as fuel, but not one uses it now. Our docks then used to be piled up with exterminated forests, and many a head was plodding away at galvanism as a motive power to supersede steam, owing to the prospect of a sudden stoppage of our steamboats for want of wood fuel. All is now changed and for the better. What has become of Dimpfel's coal burning locomotive? If it is better than our wood burning kind, why is it not generally adopted by our railroad companies? Do the superintendants imagine that as long as they provide crimson velvet stuffed seats, and travel at the rate of twenty-five or thirty miles an hour, all is well —that they have done all they can or should do for the comfort of passengers? Surely not. This is a subject to which we wish to direct attention, because we deem it one of very great importance to the community.

Mechanical Inventions.

Man only progresses; the brutes are the same from generation to generation,—the Great Creator hath endowed him with inventive faculties, and by these, in one sense, he exhibits his divine origin, and bears upon his front the superscription, "Lord of Creation." Mechanical genius and invention are the handmaids of civilization. Those countries which are now the most celebrated for mechanical inventions, stand the highest in the scale of civilization. In nothing do the moderns so much excel the ancients as in mechanical invention. What are all the triumphs of ancient art in comparison with the steam engine; the printing press, or the electric telegraph.

The origin of modern invention dates with the discovery of the art of printing and to this invention we are justly indebted for all others; it is the mother of all the rest, and we have no doubt that if the art of printing had not yet been discovered, Europe would now be in comparative barbarism, and where would we be as a great people and a great nation?

Every new generation commences life in ignorance, for every child has to acquire knowledge by labor, and teaching. But there is a vast difference between being taught to understand what others have discovered, and to labor in making such discoveries. The art of printing stereotypes the discoveries of the present generation, and the next has but to wear the gems. The press whets the inventive faculties, and this we have often remarked, for no sooner do we publish some illustrated description of a machine, than we hear from many quarters, that such and such an improvement had been made to remedy some defect. A mere hint in a paper respecting some necessary invention, will set a thousand minds to ruminate upon the best method of providing for the desired want, and thus it may be said, the press is a partner of the invention. There are quite a number of our readers who have received patents for valuable inventions, but who never thought about inventing until they became subscribers. It is thus that the world progresses in invention, communities are benefitted and civilization advances.

Short Conversations on Mechanics---No. 4.

Q. "I have now another, and but one question to ask respecting the pressure of the atmosphere. It is stated in works on the subject, that steam, given off by boiling water freely exposed, is just equal to the pressure of the atmosphere; is this true?"

A. It is; and the way I found out this truth was by a syphon—the same as I presented to you last week. At one time I wished to draw off some boiling water by a syphon, but after two or three attempts, failed to do so, when the cause at once flashed across my mind; I cooled down the water and found no difficulty in working the syphon. Boiling water, then, cannot be drawn off with a syphon, because the pressures are balanced—static. If the two legs of the syphon are equal, and the liquid in the two vessels is on a level, with an elevated division between,—thus showing the pressure to be in equilibrio—static, no water will pass through the syphon.

Q. "I am now enlightened on every point respecting the action of the syphon; and in vain have I searched works on philosophy for such information. I now wish to know about velocity, and the laws of falling bodies."

A. As I stated to you two weeks ago, all bodies in motion would move on forever in a straight line, by reason of their inertia, unless acted on by an extraneous force. A body at rest would so remain for ever, by reason of its inertia, unless acted on by an extraneous force. When we see a body fall from a height, we may rest assured that the cause of its fall is an extraneous force: this force is gravitation —it was discovered by the great Sir Isaac Newton, by noticing an apple fall from a tree (and I beg of you to be just as observing of such small events). The law of gravitation is thus enunciated: "All bodies attract each other directly, as the mass, and inversely as the square of the distance." The same affection —if I may use the term—is exhibited by the magnet, and I am inclined to the opinion, from what Sir Isaac Newton says, that he suspected magnetism and gravity to be identical—at least nearly related.

Q. "You say that bodies attract each other directly, as the mass, and inversely as the square of the distance, what has that to do with the velocities of bodies?"

A. It has everything to do with the velocities of falling bodies, such as water down the perpendicular face of a rock; and without a person understands this law, which lies at the root of the science of mechanics, he will always be committing blunders. If a solid body, such as a ball of iron, is dropped from a balloon at a mile distant above the earth, it will fall, by the action of gravity, through 16 1-12 feet of space the first second, 48¼ the next second, 80 5-12 the third, and so on, but the space through which it will have fallen in the whole time is 16 1-12 the first second, 64¼ the second, and 144¼ the third; you will thus perceive the difference and know the meaning of *inversely as the square of the distance.*

Q. "Is the force of gravity constant above the earth's centre? Will a ball, a mile above the earth, actually fall through 16 1-12 feet of the space during the first second?"

A. No; it is not constant, or it would not vary as the square of the distance; but the difference is so small that if the force of gravity at the earth's surface be represented by ·10000, a force a mile above it would be ·9994.

Q. "Can you give me a rule to determine the velocity which a body, exposed to gravity for a given time, would acquire?"

A. Yes; it is very simple:—multiply the square of the time in seconds by 16 1-12, and the product is the space through which the body will have fallen in that time. For example—through how many feet of space will a body at the end of 12 seconds, acted upon by gravity, have fallen? 12×12×16 1-12= 2316 feet. It will have fallen through that space in 12 seconds. It is also very easy to tell the velocity acquired by a body in falling from a given height; for example—what velocity will a body have acquired in falling 36 feet? Rule—Multiply the square root of the height in feet by 8 1-24, or 8 for simplicity will answer for every practical purpose; 6×8=48 feet per second. You will now perceive that a body, having a double velocity has four times the force of one moving with half the velocity; that is, gravity is inversely as the square of the distance, taking time as the unit of comparison.

Q. "No; I must say that I do not clearly understand this yet."

A. Well, I will explain it more fully next week. It is a question not understood but by those who have been taught engineering or have made mechanics a subject of study; scientific engineers can easily detect the ignorance of tyros about velocities, and laugh in their sleeves at their assumptions.

To the Patrons and Friends of Science.

We shall commence the next Volume of the Scientic American in three weeks from the present number, as has already been announced to our readers. We hope to receive a large accession to our subscription list through the aid of our friends, who have never failed to respond to our call in this respect, and we promise, in return, to render the Scientific American still more valuable and interesting to our readers. We have never devoted but a small space of our paper to the benefit of advertisers, not wishing to appropriate space due subscribers to anything but for their own benefit. We shall continue the same system rigidly, depending mainly upon subscriptions for our remuneration. We offer the paper to clubs of 10 for $1,50 per year, and we ask our readers to remember, that the cheapest scientific journal in Europe costs nearly four times that amount. We wish to place the paper in the hands of every mechanic in our country, confident of the benefit it is calculated to bestow upon them. As a work of reference alone it is invaluable, for through its columns the earliest and most reliable information connected with invention and discovery is clearly imparted.

We have always been free to discuss the merits of every important discovery which comes up, and shall pursue the same course unflinchingly, without fear or favor.

We are independent and above all cliques, and cannot prostitute our columns to promulgate false doctrine, even though by so doing many may be offended. We are friends to true genius, and therefore all pretended inventors must expect to be severely dealt with. We point with pride to our past volumes in evidence of what we intend to do in future, and when we speak to our readers it shall be in language definite and easily to be understood.

In closing our notice we must caution our subscribers to beware of travelling agents The best way to pay for any paper is to remit the amount to the publishers, as travelling agents are liable to absence of mind, and as it is a system by which the public generally get the worst end of the bargain, we warn them thus timely against it.

The "Maryland Mechanics' Institute" has unanimously invited the "American Scientific Convention," recently sitting at Albany, to meet next year in Baltimore, and to occupy the beautiful hall of the Institute—the free use of which, with every other facility that can be afforded, will be cheerfully granted. We are informed by Mr. Smith, the Corresponding Secretary, that strong hopes are entertained that the Convention will accept the invitation.

The Practicabilities of Science.

It is very easy to appear exceedingly learned without endangering reputation, and this is more justly true of all the learned bodies which make so much ado in the world. Here we have a long dissertation about a certain and eccentric philosophy of storms by one Professor, and as long a dissertation to refute it by another learned *savant.* Another learned Professor presents a long communication about snakes biting plants, and another a more profound paper on the color of herbs and animals; and yet out of all these not a solitary idea can be found of any benefit to practical science—the world is not a whit the wiser of all their abstruse logic and more abstruse deductions. It has pained us not a little, in listening to an animated discussion among learned men, about the different colors of metals, and yet not one of those who engaged in it could tell how his coat was dyed or his linen bleached. It is certainly to be regretted that so little attention is paid to the practical arts by those who are termed *learned men.* This is not the case with all of them, for among the justly celebrated learned men of our country, there are some of them who are exceedingly ingenious, and whose object is to apply their knowledge to useful purposes and for the benefit of their fellow men. The researches of Henry, Maury, Bache, Mitchell, Pierce, and many others, are especially intended for practical application—but so far as it regards the great things of life—the common arts—the learned in general are very unlearned. A tanner who knows his business is as learned a man as a Professor of Geology or Chemistry, who knows nothing about the business. It is just the same with other trades.

Ve dare say there is not a professor of chemistry in one of our colleges who could go into a calico print-work and produce the commonest colors on the fabrics; yea, there is, perhaps, not a single Professor of Chemistry in our country who is acquainted with the true theory of colors. We speak of these things in order to direct the attention of our *learned* men to the application of their knowledge and investigations to the truly useful arts. It has been truly said, that while the Professors of Old Cambridge were adding some new formulæ to Euler, the mechanic invented the steam engine; and so it may be said of almost all our useful inventions—they originated and were perfected in the workshop. In many things the laboratory is far behind the workshop, and many learned men would learn a great deal by condescending to be taught by the intelligent artisan.

English Patent Laws.

Our London agents, writing under date of the 8th inst, say, "the patent law amendment bill was last night thrown out by the House of Lords, and no change will take place in the law of patents. The bill was left too late in the year—this was the cause of the lengthy evidence taken by the committee of Lords, and the time expended in making their report. The same reason will, in our opinion, prevent anything being done the next session, for the government stands pleged to bring the whole matter before a select committee of the House of Commons, by whom evidence of greater length will be taken, and the new measures, (if any) will have to be formed thereon.

There is also great diversity of opinion on patent reform, and many difficulties in connection with it, so that we fear nothing is likely to be done for two years again, change of ministry and law officials may prevent it."

[The delay of this much needed reform is really perplexing and without the shadow of reason. The interests of Great Britain loudly call for it, as well as the inventors, and the result is deeply to be regretted.

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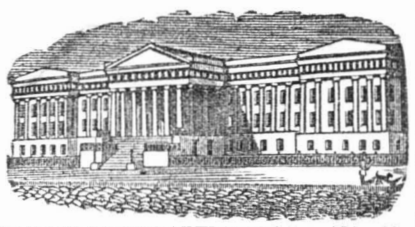

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING AUGUST 19, 1851.

To Ransom Cook, of Saratoga Springs. N. Y., for improvement in ventilating and excluding dust from Railroad Cars.

I claim the combination of the blower bellows, or forcer, with the pipes or tubes, for conveying the pure air along the train of cars, the pipes or apertures for the admission of air into the cars, the valves or inverted muffles, for controlling such admission of air, together with the valves and apertures for regulating the atmospheric pressure within the cars, and its escape from them, all as set forth.

To A. R. Davis, of East Cambridge, Mass., for improvement in the manufacture of Brushes.

I claim the described improvement in the manufacture of brushes, the same consisting in laying two or more brush blocks or plates, together, or upon one another, and either boring them before or afterwards, and each with the same number of holes, and so that each hole in each block shall be in range with a hole in each of the other blocks, and passing or inserting bunches of bristles through all the blocks, and fastening the ends of said bristles in the last block, through which they are made to enter, and separating the said blocks asunder and cutting the bristles between the blocks, all substantially as set forth.

To H. H. Huntley, of Cincinnati, O., for improvement in Cooking Stoves.

I claim the closed chambers (two) and opening, in connection with the space between the hearth plate, fire back, and boiler flue plate, and the upper portion of the ovens, at their plates, the whole being arranged substantially in the manner and for the purposes described.

To Richard Long, of Columbus, O., for improvement in Brick Machines.

I claim, first, the mode of controlling the operation of the mould bed carriage, and driving it in either direction by the combination, substantially as described, of the toothed wheel on the mud mill shaft, the rack bars and their racks and arms, or ears, attached to the carriage and the slides on the stationary framing.

Second, the mode of operating the cut-off plate, for the purpose of opening and closing the apertures communicating between the mud mill and the moulds, by means of the levers attached to them and to the framing, in combination with the wheels on the mould bed carriage, substantially as shown.

To Nicholas Mason, of Roxbury, Mass., for improvement in Cooking Ranges.

I do not claim to be the inventor of the brick oven; but what I claim is the attachment of a brick oven to a cooking range, to be heated from the same fire with which the cooking is done, as described.

I also claim the hot air chamber at the sides, of perpendicular plates, and extending as high as the horizontal plate, and all over the curved plate, and extending all around the inclined pipe and perpendicular pipe, and communicating with other pipes, in the manner and for the purposes set forth.

To John Mercer, of Oakeshaw, England, for improvement in chemical processes for Fulling Vegetable and other Textures. Patented in England Oct. 21, 1850.

I claim the process of fulling cotton, linen, and other vegetable fibrous materials, either in the fibre or any stage of its manufacture, or either alone or mixed with silk, woolen, or other animal fibrous material, by means of astringent or styptic materials, as set forth.

To Ira B. Person & J. L. Brockett, of Baltimore, Md., for improvement in Registers for Omnibus Drivers.

I claim the arrangement of a series of doors with the attachment to the axes, or hinges thereof, of levers or other mechanism, in such a manner and in such connection, by means of a rod or rods, and springs, or other suitable contrivance or device, with a dial or some like mechanism, that each door, upon being opened, will act upon such dial or other mechanism, in such manner as to indicate thereon and thereby, the number indicated by such door, the several doors indicating different numbers, respectively; also the arrangement of a strip of metal or other suitable substance, vertically, or in some other position, in connection with such dial, so that by means of a wedge upon the dial and pins upon the said strip, or vice versa, under or over which the wedge successively passes, the said strip will rise or be forced outward from the circumference of the dial, a given distance at each revolution of the dial, and indicate by the figures on the surface of such strip, near the outward or upward end of the same, successively coming in sight above or beyond the circumference of the dial, the number of such revolutions of the dial—using for the construction of the same any metal or metals, or other substance of a suitable and durable description.

To Hartwell Stanley, of Wilmington, Vt., for improvement in Boot Crimps.

I claim the lever, the knob, the bolt, and the two circular rods, in combination with each other and with the other parts of the machine, as described, for the purpose of drawing the corners of the front to their proper place, at the same time the brake is passing down over it, by turning the screw, and I make no further claim.

To Geo. West, of Tyringham, Mass., for improvement in Pulp Screens.

I claim the application of the vibrating bottom or bellows to the box, said box being constructed as described, with the partition and the screen upon its upper surface, by which arrangement the pulp is forced, by atmospheric pressure between the plates of the screen, upon the partition and off the partition into a receiving box, substantially as described.

To A. S. Hosley, of New York, N. Y., for improvement in Ships' Model Measurer.

I claim the employment, for the purpose of taking the dimensions of models of ships and all other vessels, of a pillar or post, having a graduated scale B, on one side, and an adjustable rest sliding on it, and having also a rule with any number of graduated scales on its face and leg, connected with it, both the rule and leg being capable of adjustment in lines at right angles to the face of the pillar or post—the whole being constructed and operated in the manner substantially as set forth.

DESIGNS.

To Aaron Cook, of Newtown, Conn., for design for Ladies' Combs.

British Lords and English Patent Laws.

I was pleased to read your remarks on the conduct of Lord Granville, in turning round and giving his influence not only against amending the British Patent Laws—but also in giving his influence to withdraw all protection from the inventor—in short, to abolish the patent laws entirely. I consider that every inventor has as much right to be protected in his invention as a lord has to his landed property, and your remarks were justly applied in making this comparison. What would England now have been but for her inventors and her patent laws, bad as they are? James Watt would never have found a munificent patron in a Bolton, had there been no patent protection; and the great improvement on the steam engine would perhaps not have been made yet. But when we consider that it was made, who does not rejoice that this great engineer—this man who has left a greater impress upon his age than anp other—was amply rewarded for his discoveries? And there was Arkwright, too; who does not rejoice that he lived to enjoy the fruits of his ingenuity—something which he assuredly would not have done had there been no patent laws? England is a great nation, and at present is the most wealthy in the world, but is she indebted to her "Lords and Dukes and a' that," for her wealth? No: she is indebted to the genius of her sturdy mechanics—her Watts, her Arkwrights, Cartwrights, &c. It was the industry and genius of her working people which furnished the wealth that arrayed all Europe, from the Black Sea to the Rhine, against the Great Captain, and at last chained him on a lone rock in the Atlantic. And has it come to this, that Lord Granville has just discovered that those patent laws, which excited the genius of her mechanics to invent the steam engine and spinning frame, are wrong in principle? It is something very strange, indeed. It seems that Lord Granville has had some fine pet witnesses to support his views; these were Brunell, C. E., Sir John Romily, Mr. Cubit, an engineer; a Mr. Ricardo, and a sugar refiner named Fairie, a patent pirate. The inventors, however, had a noble friend in that veteran Scotch philosopher and inventor, Sir David Brewster. He asserted that Government should give patents without any charge whatever, because the public were the real gainers, after all, by inventions. It is very singular that Englishmen have always been the greatest pirates of the patents of their own countrymen: old Richard Arkwright knew and felt this; he therefore joined with David Dale, the grandfather of our Robert Dale Owen, of Indiana, to reap joint benefits; he got Dale to be his "Scotch razor," as he termed him, to shave his piratical English friends. David Dale was not a harsh man, but he was a just man; he was one of the most benevolent men that ever lived, but he would do or die in extorting justice from wilful evil doers, and was the very man for sturdy plain Dick Arkwright. The business could not have been entrusted in better hands,—and so Arkwright died the richest commoner in England. He did more for England than all the Lord Granvilles that ever lived.

The new Bill to amend the British Patent Laws, I understand, will make them decidedly worse than they now are; and it will cost more to get a patent for fourteen years, than it now does. English statesmen are learning to legislate backwards. It has been asserted that the most reprehensible means and measures have been taken to rush this ugly Bill through Parliament. Inventors throughout the world feel interested in the rights of one another, and the American inventors cannot but feel interested in this case, as the English Patent Laws are laws for the rich and not for the poor and really deserving inventor.

JUNIUS REDIVIVUS.

Fish Breeding.

A curious branch of husbandry is practised in France, in the valley of the Soane. A characteristic feature of this part of France is the vast number of small lakes or ponds by which the surface is studded. In one department, that of Saone et Loire, there are actually upwards of 2,000 of these sheets of water, principally lying to the east of the Swiss side of the Saone. A century ago the number is said to have been nearly double. but the proprietors are now draining and turning the bottoms of their lakes into corn-fields and meadows. The sheets in question are for the most part shallow, rushy ponds, with marshy borders. They are of all sizes, from mere pools to lakes of from fifty to one hundred acres in extent; and they play a very curious part in the agriculture of the district, many of them being alternately dried and refilled, the proprietor raising corn one year in the precise spot in which he caught fish in the preceding summer. It is a mooted point in the district whether the superficies in question is most profitable in the shape of ponds or fields. The opinion generally gaining ground appears to be in favor of an occasional change from one element to the other—in favor, in fact, of making the ponds play a part in the routine of cropping, and refreshing and invigorating the land at certain intervals, by turning water upon it, and rearing carp and perch above it. The small ponds are commonly used for rearing the fry which are destined to acquire their full growth in the larger sheets of water. The plan of operation in its outline is as follows: at the commencement of winter, from ten to fifteen carp are turned into each small pond, great care being taken that no pike manages to slip quietly in along with them. The next year the water nurseries are dried, and thousands of young carp are found sprawling in the mud. The fry is called *la feuille*, and is let loose in larger ponds in the ratio of about 1,200 little fishes to an acre. Here the creatures pass the second year of their life, attaining a size of about four or five inches. In this stage they are called carpillions or alvins, and are subject to the same treatment as before, the pond being again drained and its occupants turned out into a still larger piece of water. In this third dwelling place they take their final development. They are flung into it in the proportion of about 180 carpillions per acre, and are taken out again in one two, or three years afterwards, according to the size of fish required. The carp fatten fast in rich, muddy waters, sleeping stagnantly in the bosom of fat fields and stiff alluvial soils. The ponds sprinkled among the woods are the worst feeding places. Into the small ponds some dozens of small pike are let loose, destined to keep down the young carp, so that the large fish may have the advantage of the best possible feeding. The final fishing generally takes place early in spring. The water is drained off, and the fish are caught by hand or by hand-nets. They are usually sold upon the spot, either by the hundred or by weight, to the agents of fishmongers in the neighboring towns, occasionally to the tradesmen of Lyons, by whom they are carted off in casks pierced with holes and half filled with water. The critical time for the interests of the fish-breeder is the draining off the water, lest the creatures die in the mud; the critical time for the fish-monger is the carting them home, lest they die in the cask. It is a common practice, after a pond has been fished for three successive years, to drain it thoroughly and to sow maize or oats for as many seasons as the earth has been under water. Near Chalons, three years water and three years crop is the rule. The larger ponds yield from 4,000 to 6,000 carp annually.

Vinegar Adulterations.

Great pains are requisite in purchasing vinegar, as it is now manufactured to a great extent throughout the country. Much of that recommended for its whiteness of color and generally purity, combined with great acidity, is made by adding sulphuric acid to pure water. This is sometimes colored by adding burnt sugar in order to conform to the appearance of ordinary cider vinegar, while the former is sold as white wine vinegar. This deception is a very important one. Sulphuric acid is an acid poison and possesses corrosive properties very different from acetic acid, and other properties upon the stomach and blood which it is unnecessary here to mention; but which make it evident that the effect of this combination, used as an article of daily food, is highly deleterious to health. Sulphuric acid has moreover an affininity for lime and its compounds, which renders it very destructive to the teeth. I have before mentioned that a travelling quack dentist in and about New York is persuading the ignorant to allow him to cleanse their teeth from tartar, &c., with his preparation, which is nothing but sulphuric acid, and is certain destruction to the teeth. I have not intended to give a thorough discussion of this subject, but only to put people upon their guard in respect to an article upon everybody's table.

[The above is from the Newark Advertiser, and should meet with careful attention.—There can be no doubt of the fact that much *vinegar* made of sulphuric acid, is sold for the genuine article.

The first sign of the return of the dark ages is manifested in the new Postage Law. The American people must wake up or they will soon find themselves taxed for the very air they breathe. Barnum ought to have the concoctors of this law on exhibition—they would really be a curiosity, and afford him many a two shillings.

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TO CORRESPONDENTS.

W. H. E., of Ky.—You do not require two cylinders to drive the main shaft, although two is better than one. It would not operate well, we believe, to extend the walking-beam and attach a saw frame to each extremity. The resistance at these points would tend to destroy the parallel motion. As the resistance in sawing is oftentimes unequal, it is better to take the reciprocating motion from a wheel on the main shaft, as there is always a surplus power to render the action equal. The motion of the sawscan also be better controlled by taking the power to drive the frames from a revolving shaft. With attention to the journals, there is not much loss by friction, as some suppose.

J. R , of Mass.—You can probably obtain such articles as you want from Messrs. E. & G. W. Blunt, nautical instrument makers, 479 Water street, this city. The probable cost we do not know.

J. B G. H., of Mass.—We have not heard from the Luzerne Co. man yet. We think Page, of Hartford, has a patent for the self-adjusting friction plate. We may not understand the point, but we think we do.

J. B., of Md.—You will hear from us about the bolt in a few days.

H. S., of N. Y.—We like your views upon the static or equilibrium pressure engine so termed, but thought best not to publish them on account of having given more space to it than the subject is worth.

E. C. B., of N. J.—We have decided that your plan of a governor is new and patentable: you had better send a model.

S. & McC., of Tenn.—If you will address a letter to R. W. Withers, Esq., at Greensboro, Ala., he will be able to give you more information concerning artesian wells and the tools used in boring them than we are able to. $4 received for two subscriptions and credited accordingly.

B. M. H., of ———.—John Leeming, of Taunton, Mass., says he can produce testimonials as to his ability to manage a starch manufacturing establishment. You had better address him upon the subject.

F. Van D., of Mich.—The model of your carriage gearing has come to hand, and has been examined in connection with Mr. Everett's, and believed not to possess any feature of a patentable nature. The adaptation of friction rollers, we think, is practically an improvement, but it would be merely an application of a well known device for a well known purpose applied to a new use. It is not possible for us to inform you when your case will be decided upon.

W. D. H., of Pa.—Mr. Palmer's patent was granted Jan 16, 1843.

J. N. R., of O.—The Patent Laws ordered by you have been sent. You have the right to manufacture in one State and sell in another, of course, if you own the rights for both States, but if peddling without a license is prohibited in the State you desire to sell in, then you must provide yourself with a license. Patented goods cannot be sold in States where a license is required, any more than if they were imported.

F. L , of Me.—We should judge from the description you give of your invention that it was patentable, but without examining a drawing or model we cannot advise you understandingly.

G. F. J. C., of N. J.—Yours next week.

S. N., of O.—We have credited you with the $1 sent, on account of subscription to the Scientific American, not being able to furnish such information as you ask for. We shall publish an engraving of the machine when the patent is issued.

A. H., of N. Y.—We would advise you not to send so lengthy communication to the Commissioner. It would not meet deserved attention. If you wish we will cut it down and have it copied and sent up for signature before transmitting it to Washington.

C. B., of Ohio.—We do not see upon what point you can sustain a claim in the moving machine. It is a doubtful case, as we view it.

E. A. D., of Mass.—We advise you to look out for the "Annihilator;" notwithstanding all that has been said in its favor, we believe it to be a complete humbug, and so stated several months since. Scientific journals of high standing in London have spoken against its real practical utility, and more are joining us when they come to investigate the matter of fact in the case. The notices appearing simultaneously in the newspapers, are doubtless paid for by some one able to do it, as a sort of paving the way for its introduction.

W N. Reed, of ——.—If you will inform us where you reside we will endeavor to reply to your inquiry. Your letter neither contained a town, county, nor State, and the postmaster was equally remissive in not post-marking it. $5 received, which will be used for your benefit as soon as we hear from you.

W. R. & Co., of N. Y.—Your draft for $40,50 has been received. The balance of your order shall be attended to forthwith.

C. P , of Me.—No patent can be obtained for your car wheel; Stephenson's English Patent, of 1851, covers the entire contrivance. The variety of car wheels is very great, and it would almost seem impossible to project any thing new in them; but as we are an advancing nation, no one can predict what changes may take place. It is certain we have not reached the culminating point.

L. V. B., of Ind.—The drawing of your alleged improvements in machinery for cleaning hemp we have examined. We believe the contrivance to possess sufficient novelty to warant you in filing an application for a patent. We have no doubt it will work well, but of course cannot speak positively without the aid of experiments. You had better send a model as soon as you can construct one. It will be kept strictly confidential, as are all other models deposited in our hands for patents.

J. S. V., of N. Y.—If Dr. Hood has a patent for the employment of two separate pads, a claim could not be instituted for it again. The purposes are the same. You will understand that patents are exclusive property, and that they extend over the entire jurisdiction of the United States.

A. B., of N. Y —We have never seen a cheesepress like yours, but Mr. Cater presses the cheese by the weight of the frame, and there is what is termed the self acting lever cheese press. Mr. Foreman has not a patent for his press. We advise you to lay out no expense in the expectation of any economical result in the employment of galvanism to work the printing press, this has been tried and laid aside.

W. H. P. of Ind.—Yours will be attended to next week, and if we can get all the information you want it shall be given.

S. R. T., of N. Y.—Just wait a few months as you say, and then people will be wondering what has become of the centrifugal deception.

J. K. J., of Pa.—We have never known of any plan similar to yours for making the conical coiled spring. So far as we can judge correctly, we believe it to be patentable. If we discover that it is not within two weeks, you shall be informed of the same.

R. S. H., of Va.—Acetate of copper is verdigris; blue vitriol is the sulphate: use either for the ink, but the sulphate is not so permanent.

Money received on account of Patent Office business since August 23:

C. C., of Ct., $50; M. C., of Ill., $5; W. C. B., of N. Y., $20; W. S., of R. I., $30; H. A. L., of N. Y., $25; T. M., of Pa., $30; N. & F., of N. Y., $35; E. S., of Mass., $30; P. & M., of ——, $20; M. M., of Wis., $30; B. O'B., of N. Y., $30; J. L. Van D., of M ., $52; J. B., of Pa., $10.

Specifications and drawings of inventions belonging to parties with the following initials, have been forward to the Patent Office during the week ending August 23:—

W. S , Jr., of Vt.; M. C., of Ill.; E. S., of Mass.; J. B., of Pa.; J. L. Van D., of Me., M. M., of Wis.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2, and 3—none.
Of Volume 4, about 20 Nos , price 50 cts.
Of Volume 5, all, price, in sheets, $2; bound, $2,75.
Of Volume 6, all back Nos., at subscription price

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

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" 12 lines, 75 cts., " "
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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents. In the item of charges alone, parties having business to transact abroad, will find it for their interest to consult with us, in preference to any other concern.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

PRAIRIE FARMER WAREHOUSE, Chicago, Ill —The undersigned are prepared to manufacture extensively various kinds of labor-saving machines for farmers. Patentees having good, well tried inventions which they would like to introduce into the West, are desired to inform us of them — With those having the best machines of their kind, we will be glad to make arrangements to manufacture, paying a stipulated price on each machine sold. We buy no rights. Our shop is centrally located, with a 40 horse-power engine, and we believe we can offer good inducements to patentees. T. S. Wright has a large acquaintance with western farmers, having for more than ten years published the "Praire Farmer," the leading agricultural paper in the West; and Obed Hussey, the first inventor of the reaper, is a practical, good mechanic. WRIGHT & HUSSEY.
50 2*

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions: Washington Factory, Newark, N. J. 38 13*

MACHINERY FOR SALE.—One second hand 8 horse-power Engine, with boiler, heater, pipes &c; 1 new 6 horse Engine; 4 Screw Presses, different sizes; 1 pair of Power Rolls, chilled and polished, with full set of gearing for rolling cold metals in perfect order. Also constantly on hand, and now manufacturing, Upright Drills, Slide and Screw Cutting Lathes, Mortising Machines, &c. Inquire or address (post paid) CARPENTER & PLASS, Machinists, corner of Hester and Elizabeth st., N. Y. 1*

CHANCE FOR A MACHINIST TO COMMENCE BUSINESS,—For sale, at No. 2 Bethune st., N. Y., all the tools belonging to a snug small machine shop, with good will of the business. There is a slide, back gear, and hand lathe; a boiler, and one of Wiley's improved 3 horse-power engines, and patterns for making the same, together with a drill, and all the tools, in good order, to carry on the business, which is now very good and can easily be increased. Price only $1200. Also for sale a first rate 30 horse-power engine and boiler for $1200. 49 2*

JACK-SCREW FOR RAISING BUILDings, Locomotive Engines, and other heavy bodies, also double and single threaded vice screws, mill screws for raising mill stones, cheese press, carpenter's clamps, and music stool screws, all of which are warranted to be superior articles: manufactured and for sale wholesale and retail by Tolman & Brown, Hinsdale, N. H. "We have examined the screws manufactured by Messrs. Tolman & Brown, and believe them to be of the finest quality, both as regards the workmanship and durability. MUNN & Co." 48 4*

CHICAGO SEED STORE AND AGRICULtural Warehouse.—The undersigned have formed a co-partnership under the name and style of Starkweather & Hooker, for the purpose of establishing a Depot in Chicago for the purchase and sale, on commission or otherwise, of Seeds, Agricultural and Horticultural Implements, Machines, &c , of every description, respectfully solicit the attention of agriculturists and manufacturers of implements, to our establishment, and give assurance that every facility will be offered for ready sales on the most advantageous terms. C. R. STARKWEATHER,
48 4* J. W. HOOKER.

RAILROAD CAR MANUFACTORY.—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
39tf. THOMAS J. FALES.

WANTED.—A situation is wanted by a person capable of planning and constructing furnaces for smelting iron ore, or erecting rolling mills. He is an experienced mechanic, thoroughly conversant with the iron business, and would like a permanent situation in some of the Southern States. Address M. E., Dover, N. J. 45 10*

LAW'S PLANER FOR PLANK, BOARDS, &c., is now attracting much attention on account of its effectiveness, the excellence of its work, its simplicity, and consequent economy. Machines are now in operation in Brooklyn, New York City, and at various points South and West. Rights or machines for sale by H. LAW, 23 Park Row. 45 tf

INDUSTRIAL EXHIBITION.—The "Maryland Institute for the Promotion of the Mechanic Arts," will hold its Fourth Annual Exhibition of American Manufactures, Machinery, &c., in the splendid new Hall, now being finished at Baltimore, from 20th Oct. to 18th Nov. next. Mechanics, manfacturers, and others are cordially invited to deposite specimens of their best productions, in competitions for the Gold and Silver Medals, Diplomas, etc. Steam power, labor, &c., is offered free to despositors. Great care will be taken that fair play shall be shown to all the exhibitors. Those desiring to deposite articles are required to notify the Committee at once, stating the nature of the goods, and the probable amount of room required to display them to advantage. Circulars containing full particulars, rules, &c., with a view of the Institute's New Hall), may be had by addressing the Agent, J. S Selby, or the undersigned, who will promptly give any other information to those who desire it. See editorial columns of Sci. Am , of Aug 2, 1851. ADAM DENMEAD,
46 5 Chairman Com. on Ex.

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., have on hand six 12 ft. slide lathes, 28 in. swing; also four 8 ft. do., 21 in. swing, with back and screw gearing, with all the fixtures; one 5 ft. power planer; 12 drill presses, 4 bolt cutting machines, 30 small slide rests; 5 back geared hand lathes, 21 in. swing; 15 do not geared; 8 do. 17 in swing on shears 5 1-2 feet; 25 ditto with and without shears, 13 in. swing, counter shafts, all hung if wanted suitable to the lathes. Scroll chucks on hand; also index plates for gear cutting. Cuts of the above can be had by addressing as above, post-paid. 47tf

KELLY & CO., New Brunswick, N. J., Foundry and Machine Shop, manufacturers of Stationary Engines, India Rubber Machinery, Mill Gearing and Stove Castings, &c. Articles made in the machinery line to order with dispatch and in the most workmanlike manner. Parties wanting machinery or castings made will be waited on within any reasonable distance. Orders solicited. 47 12*

MANUFACTURE OF PATENT WIRE Rope and Cables, for inclined planes, suspension bridges, standing rigging, mines, cranes, derick, tillers, &c., by JOHN A. ROEBLING, Civil Engineer, Trenton, N. J. 47 1y*

WANTED IMMEDIATELY—To go South, one smith, two pattern makers, and one finisher, who must not only be good workmen but possess qualifications which belong to gentlemen, they must be temperate, honest, and faithful. To such, permanent employment and good wages will be given. For particulars, address, post-paid, MUNN & CO., at this office immediately. 46, tf

MECHANICS' INSTITUTE FAIR.—The attention of Mechanics, inventors, and artisans is especially called to the Polytechnic Exhibition, which will open at the rooms, cor. Bowery and Division st., on the 15th of May. Those who wish to exhibit models, machinery, &c., of mechanical skill, and those who would like to carry on, permanently, any mechanical occupation that would be in any way curious or attractive to visitors, are requested to call on the Actuary. Steam power will be provided. Well-lighted, warmed, and airy rooms can be had on liberal terms. As this Exhibition is permanent, an excellent opportunity is offered to skillful mechanics to bring themselves into notice. Articles may be sent in immediately and will be taken care of and insured. Z. PRATT, Prest.; T. C. DODD, Actuary. 34tf

A CARD.—The undersigned beg leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton st. 42 3m*

BEARDSLEE'S PATENT PLANING MAchine, for Planing, Tonguing, and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine Shop and Foundry of Messrs. F. & T. Townsend, Albany, N. Y., where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the above-named foundry, or at his residence. No. 764 Broadway, Albany. GEO. W. BEARDSLEE. 43tf

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L I., N. Y., by QUARTERMAN & SON,
48tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines Dick's Presses, Punches, and Shears; Mortising and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c Letters to be noticed must be post paid. 38tf

IRON FOUNDERS MATERIALS—viz., fine ground and Bolted Sea Coal, Charcoal, Lehigh, Soapstone, and Black Lead Facing. Iron and brass moulding Sand; Fire Clay, Fire Sand, and Kaolin; also English, Scotch, and Welsh Fire Bricks—plain, arch, circh, circular, and tower cupola, for sale by G. O. ROBERTSON, Liberty Place, between 57 and 59 Liberty st., (near the Post Office), N. Y. 44 12*

AARON KILBORN, No. 4 Howard street, New Haven, has on hand, and is now finishing, five 14 horse power engines; price, including boiler and all fixtures, $1200; twelve of from 12 to 6 horse-power, all of the most approved patterns, iron bed frame and pulley balance wheel. Galvanized Chain, and fixtures for chain pumps always on hand and for sale. 45 10*

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers. THOS. PROSSER & SON, Patentees,
16tf 28 Platt st., New York.

LATHES FOR BROOM HANDLES, Etc. We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles, and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid) MUNN & CO.,
At this Office.

MONTGOMERY MANUFACTURING CO'S Iron Works, Montgomery Ala. Capital invested, $250,000. Steam Engines and Boilers, Reuben Rich's cast-iron centre vent water wheel and iron scrolls complete (the very best wheel in use), sugar mills, saw and grist mill irons of most approved patterns, iron and brass castings of every variety, &c. Orders promptly executed, and upon terms as favorable as can be secured from the best northern establishments. When required, deliveries made (through their agents) at Mobile or New Orleans. Address GINDRAT & CO., Agents. 42 3m*

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th, 1850, is, without doubt, the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber, and so great was the favor in which this machine was held at the last Fair of the American Institute, that an unbought premium was awarded it in preference to any other on exhibition Persons wishing for rights can address, (post-paid) JAMES D. JOHNSON, Easton, Conn., or Wm. WOOD, Westport, Ct. All letters will be promptly attended to. 37tf

LEONARD'S MACHINERY DEPOT, 109 Pearl st. 60 Beaver, N. Y.—The subscriber is constantly receiving, and offers for sale, a great variety of articles connected with the mechanical and manufacturing interest, viz., Machinists' Tools—engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, bolt cutters, slide rests, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing,—wrought iron shafting, brass and iron castings made to order. Cotton and Woolen Machinery furnished from the best makers. Cotton Gins, hand and power, and power presses. Leather Banding of all widths, made in a superior manner; Manufacturers' Findings of every description. P. A. LEONARD.
48tf.

GREAT REDUCTION IN PRICE.—The most valuable book of the day, containing domestic and medical recipes, rules with regard to the recovery and preservation of health, an account of the different medical theories of the day, useful tables, &c., entitled "THE GRAEFENBERG MANUAL OF HEALTH." It is complete in one volume of seven parts, and is beautifully printed upon fine paper, in a convenient form of 300 pages. The immense success which has attended the sale of previous editions, has warranted a reduction in the price of this (the 7th) edition, from 50 to 25 cts. per copy. Any number of copies, from one upward, will be forwarded upon the receipt of the money, (post-paid). Address THE GRAEFENBERG COMPANY, 214 Broadway, N. Y., or this Office. 38tf

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Scientific Museum.

For the Scientific American.

Lightning Conductors and the Action of the Electric Fluid.

Will you allow an occasional reader of your valuable journal to direct your attention to a careful gathering of undoubted facts in reference to the operation of the electric fluid, in striking barns and dwelling houses, especially in the country. My own conversation with intelligent residents here convinces me that there is a lamentable want of statistical knowledge on this important subject. Many deny the utility of conductors of any description, others say their only operation is in a circle of thirty feet radii. My own theory is, that conductors are of great use in silently equalizing the electricity of the earth and clouds, which, I think, can be readily demonstrated by the application of the button of a Leyden Phial to one, at or near the ground during the passage of electric clouds. That being conceded, it is only necessary to determine what size and height the conductor should be raised to produce the desired effects in all phases or condition of electric action, which is no doubt often duplex in its character, as I once had a beautiful demonstration of. Some twenty years since, standing in my store door, near Fulton market, I remarked two several clouds, one from the south-east and the other from the north-west, driven rapidly towards each other, over the store on the corner of Pine and South streets, and when apparently within a few inches, repel each other, and from the south-east cloud a vivid bolt shot down to the earth, and the instant after another from the earth shot up into the north-west cloud, and instantly the clouds met, deluging the earth with torrents of rain. The concussion of the air caused the coping to be thrown from the store on the west corner of the street, and the dust from the mortar, raised by the falling coping, appeared as if the building was on fire; but I do not recollect of an other damage.

Old people relate various anecdotes of the action of the electric fluid, such as holes made through the roofs of barns without ignition, and sometimes when either end thereof had short rods upon them. In one case a locust and an ash tree, standing on either side of a large rock, were struck at the same time, and the ground was plowed up near the ash tree; it is known they were marked, both on the west side, and the plowed up ground communicated with a wet spot—a known conductor of electricity. The double action, as described above, will explain it; the bolt from the earth passing along the wet vein and up the ash tree, in its connection with the clouds. Another tells of a similar wet place, with a flat rock, surrounded by tall trees, and some ten or twelve of which have been struck at various times. One fact is noticeable, I hear of no striking of barns, unless they have just had the new hay put in, perhaps the natural heating and fermentation may evolve the fluid and cause conflagration. If so, would any conductor, unless communicating therewith, be of any service? S. N. D.

White Plains, N. Y.

Physical Composition of Man.

"Science," says Liebig, "has demonstrated that man, the being who performs all these wonders is formed of condensed air, (or solidified and liquefied gases;) that he lives on condensed as well as uncondensed air, and clothes himself in condensed air, and by means of the same agent moves the heaviest weights with the velocity of the wind. The strangest part of the matter is, that thousands of these tabernacles formed of condensed air, and going on two legs, occasionally, and on account of the production and supply of those forms of condensed air which they require for food and clothing, or on account of their honor and power, destroy each other in pitched battles by means of condensed air; and further, that many believe the peculiar powers of the bodiless, conscious, thinking and sensitive being, housed in this tabernacle, to be the result simply of its internal structure, and the arrangement of its particles or atoms; while chemistry supplies the clearest proof that, as far as concerning this, the ultimate and most minute composition and structure, which is beyond the reach of our senses, man is, to appearance identical with the ox, or with the animal lowest in the scale of creation.

Hydraulics.

True Theory of the Action of Water on Re-Action Wheels.

[Continued from page 392.]

[This article is by Mr. J. B. Conger, of Jackson, Tenn., the inventor of a valuable improvement on Re-action Wheels, and a gentleman well qualified, in every respect, to impart information on the subject.]

The application of water in the same direction as the motion of the wheel, began to be applied about 1830, but the true principle of action was unknown to the inventors. In your article on Hydraulics, page 264, this Vol. of the Scientific American, you have beautifully illustrated the fact that water will rise to the same height as the head by giving it a whirling motion, but have not given the principle of action, for it is a well known fact that the re-action wheel acts as well when the water is let on the wheel at the outside and is discharged at the centre, as when let on at the centre and discharged at the circumference. [See page 354, Sir Isaac Newton "On Whirling Water," in corroboration of the above, against all centrifugal nonsense.—Ed.]

The Common Re-action Wheel—Barker's.—In mechanics, all matter may be considered as continually under the operation of forces which, if mutual, and in opposite directions, maintain it in equilibrio. But if a portion of the force, acting in any direction on a body at rest, be removed, the body will then tend to move in an opposite direction to and with a force equal to the force removed.

The characteristic property of fluids is, that they transmit a pressure applied to them in all directions. Agreeably to this law of fluids; the water in the re-action wheel will press with a force on the whole of the inner surface equally, which force of pressure will be equal to the weight of a collection of water and the perpendicular height of the head. If the issues of the wheel be closed it will not tend to move—the principle of equal pressure will hold it in equilibrio; but open the issues, and a pressure is removed from that side of the wheel equal to the weight of a column of water the size of the apertures and height of the head, and the preponderance pressure will cause the wheel to move in a contrary direction with a force equal to that removed. The pressure that is removed is expended in giving velocity to the effluent water; but it does not necessarily follow that the efflux of the water gives to the wheel a tendency to move in a contrary direction; it merely proves that, as the wheel was at rest before the removal of the obstruction of the issues, that there is a force taken from the wheel in that direction equal to the force that overcomes the inertia of the effluent water, and, consequently, the preponderant force will be equal to the force removed. It is not the pressure removed that moves the wheel—it held it in equilibrio, or from moving, whilst it remained, but when it is removed, the opposite pressure preponderates, and moves the wheel with a force precisely similar to that removed.

This proponderant force of pressure will act invariably independent of the velocity of the wheel, and were it not for an antagonistic force, would impel it on with accelerated motion until overcome by friction. The antagonistic force is the inertia of the water entering the wheel, the intensity of which is directly as the velocity of the wheel. And when the velocity of the wheel equals that of the effluent water, the antagonistic force will equal the preponderant force that impels the wheel.

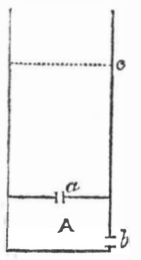
The quantity of water entering the wheel will equal that issuing from it, and the force necessary to give it a velocity equal to that of the effluent water, will necessarily equal the force that gives motion to the wheel; therefore, if the wheel moves with a velocity equal to that of the water issuing from it, an equilibrium will subsist between these two forces, and the effect will be nothing. But if the wheel move with a velocity less than that of the effluent water, then the force necessary to overcome the inertia of the water entering the wheel and to give it an equal velocity, will equal such part of the pressure that impels the wheel, as is indicated by subtracting the velocity of the wheel from the velocity of the effluent water; and the effect will be equal to the preponderant force, less the antagonistic force, multiplied by the velocity of the wheel. Or, as the velocity of the water less the velocity of the wheel, multiplied by the velocity of the wheel—the power being the velocity of the water multiplied by the velocity of water.

It is susceptible of being proved by analytical investigation that, to produce a maximum effect, the wheel should move just one half as fast as the water issues from the wheel, when the coefficient of effect will be ·25.

I do not conceive that Mr. Parker fully explains the principle of action; I think that centrifuge—or the centrifugal force of the water—has nothing to do with its action. A proof of the correctness of this is, that the effect will be equally as great when the water is let on the outside of the wheel and discharged towards the centre, as when discharged outwards. And if we consider what centrifugal force is, that it is only that principle in matter called inertia—the indifference to motion or rest—the resistance that a body in motion makes to a change of its duration; and that there is an expense of power required to give the water motion before there can be any centrifugal force; we may perceive that the effect gained by centrifuge is merely imagination.

The velocity with which water issues from under any head, is as the square root of that height, consequently the velocity from under one half the head will be something more than 7-10 of that due the whole head (·7 is near enough the truth, it being the square root of ·49 instead of ·50.)

Fig. 63.



If water issue through an aperture, *a*, into an apartment, A, from which it issues at another aperture, *b*, of equal size; then the velocity at each aperture will be ·7—that due the whole head being 1; and the pressure on each bottom of the vessel—let the upper one be situated at any height above the lower one—will be just one half that of the weight of the whole column of water, *c*, *b*.

Space being infinite there is, strictly speaking, no such thing as absolute motion, it is only relative—a change of situation in one body as relates to another; therefore two bodies moving on together may be considered as at rest. Thus much premised, the principles of action of water on those wheels are easily explained.

If a re-action water wheel, moving with a velocity equal ·7 (that due the whole height of head being 1), have the water let on it in the direction of it motion through a chute or chutes equal in size to that of all the issues of the wheel, then the velocity of the water and wheel will each be equal ·7, and the pressure of the water on the wheel equal to ·5 of the whole head; the water will act on the wheel precisely as it would if both were at rest, and therefore it will issue out of the wheel with a velocity due one half the whole head, *c e*, ·7, as relates to the wheel, but as the wheel is moving with the some velocity in a contrary direction, it leaves the wheel without actual velocity.

As the wheel moves with a velocity equal that of the effluent water, and with a force equal to the weight of one-half the whole column of water, the co-efficient of effect is ·50, or double that which it would have been had it been let on to it without a motion in the direction of the wheel—a common re-action wheel.

(Concluded next week.)

The Discovery of the Original Manuscript of the Acts of the Apostles.

A Greek Savant, M. Simonidis, pretends to have discovered, in the different convents in his country, the archives of which he has been collecting, the place where the original of the Acts of the Apostals is hid. It is, according to his account, in the small island of Antigonus, situated at the entrance of the Sea of Marmora. M. Simonidis has demanded, through the Sardinian Minister, an authorization to make a speedy research in that spot, in the presence of the learned men of Constantinople; he particularly wishes to have some geologists with him, in order to be the better able to prove that the earth has not been moved for ages in the spot which he points out. It is said that the Greek Patriarch, fearing that such an important discovery might lead to fresh schisms in the Church, has besought the Porte to refuse the authorization asked for. It is, however, thought that it will be granted, and that the search will commence immediately.

LITERARY NOTICES.

Sartain's Union Magazine, for September, has several most beautiful engravings: "St. Cecilia," by the proprietor, Mr. Sartain, is a master piece. This magazine is among the most popular serials of the day, and deserves an extensive patronage. Dewitt & Davenport are the New York agents.

Graham's American Magazine, for September, has been sent us by Messrs. Dewitt & Davenport, Tribune Buildings: it is a beautiful number both in the style and quantity of engravings, and also in the sterling variety of contributions furnished each month.

Le Genie Industriel, published in Paris by MM Armengaud. Bros. This publication is issued monthly, and is devoted to the Arts and Sciences. The engravings are finely done upon copper, we should judge, and, taken as a whole, is a highly creditable and useful publication.

Dictionary of Mechanics and Engine Work.—No. 38 of this able work, published by D. Appleton & Co., is received. We perceive that Mr Adams has edited it the last twenty numbers.

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